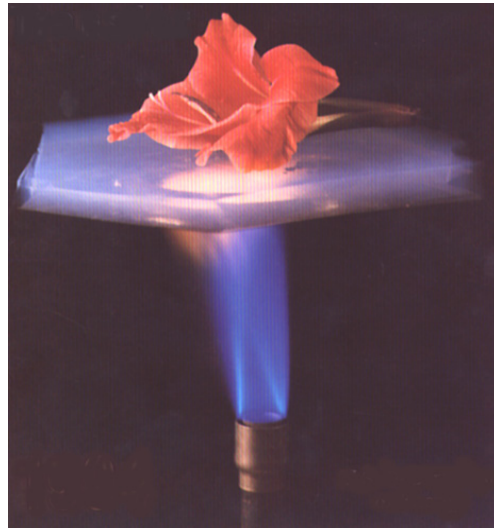


## REF: 07 DESIGN FEATURES

### FEATURE 1: AEROGEL

**A**t first sight, aerogel resembles a hologram. A highly insulative solid material, aerogel has the lowest density of any known solid. One form of this extraordinary substance is 99.9 percent air and 0.1 percent silica dioxide (by volume). One thousand times less dense than glass, aerogel has earned the nicknames "blue smoke" and "solid smoke." It is an important material for our future.

A block of aerogel as large as a human may weigh less than half a kilogram (or less than a pound), yet support the weight of a subcompact car (about 454 kilograms, or 1,000 pounds). At the Jet Propulsion Laboratory (JPL), an enhanced form of aerogel has been developed for use in several spacerelated applications.



#### Aerogel: The Story

Aerogel was discovered in the late 1930s. Since then, numerous attempts have been made to further understand and develop aerogel technology. The research leading up to aerogel's use in modern applications has further exposed the remarkable physical properties of the material. Aerogel holds six "world records" for physical properties.

*Left: Aerogel is as delicate as a flower, yet durable enough to withstand extreme environments.*

*(Photograph courtesy of Ernest Orlando Lawrence Berkeley National Laboratory.)*

#### Material Made for All Humankind

Aerogel starts as a silica dioxide gel, similar to the gelatin dessert one might make at home. Then the liquid in the gel is removed without collapsing the gel (normal evaporation causes the gel to collapse). Through a process called supercritical drying, the material does not collapse but retains its original size and shape.



Applications in construction include:  
**In Walls** — Aerogel is a nontoxic, nonflammable alternative to current thermal and sound insulation materials.

**In Windows** — The "see-through" quality of aerogel, with its high thermalinsulation properties, could save consumers money by lowering utility bills in summer and winter.

Considering the outlined properties, **Floor** and **Dome** construction take aerogel applications in buildings even further.

For more information about aerogel, please visit Hubert van Hecke's aerogel page <http://p25ext.lanl.gov/~hubert/aerogel/> as well as the NASA STARDUST mission:

STARDUST Project Opportunity and Outreach Office, M/S 301-429

Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109-8099  
World Wide Web Site —  
<http://stardust.jpl.nasa.gov>

### FEATURE 2: THE GREENHOUSE



A greenhouse creates a new living or working area, in fact a space that will remove the dividing line between inside and outside, so that each environment is enriched by the awareness of the other.

It can extend your home on one or more levels, opening it up to light, sun and the surrounding landscape.

Imagine a conservatory design studio, or a greenhouse cum poolside lounge!

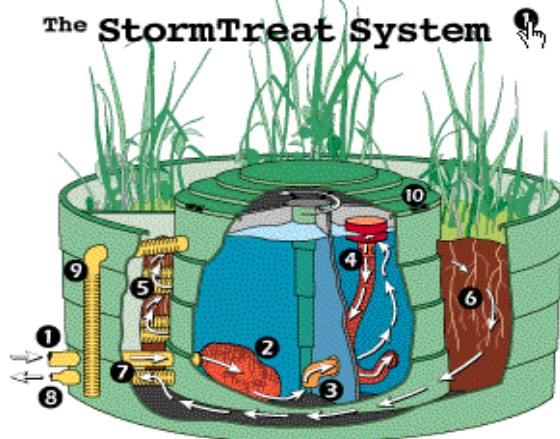
On top of all that, come rooflights as atriums, combining natural light with a moderating micro-climate.

Thus, much contrary to popular belief, greenhouses do not serve just to provide the heating effect of the "greenhouse" effect and heat up the house interior (which is its primary technical function), but also to enhance one's lifestyle and replenish the soul.

### FEATURE 3: RAINWATER COLLECTION AND TREATMENT

Surface water can easily be utilised in this EcoHouse design to reduce the domestic water consumption expenses. Being earth-sheltered, the water tank is protected from extremely low or high temperatures. The earth falls around the tank

are profiled in such a way as to funnel the rainwater into the tank.



The collected water is then thoroughly treated for domestic consumption using the state-of-the-art StormTreat System™ produced by StormTreat Systems, Inc. Rainwater is treated by 100% biological means and is 100% safe for domestic use.

Micro-Flo® collector system for unsurpassed heat exchange efficiency.

#### FEATURE 4: HVAC AND IAC

Even if you don't live in an ultra-efficient home, you have probably spent some time recently weather stripping doors and windows, caulking around frames, filling walls and attics with insulation.

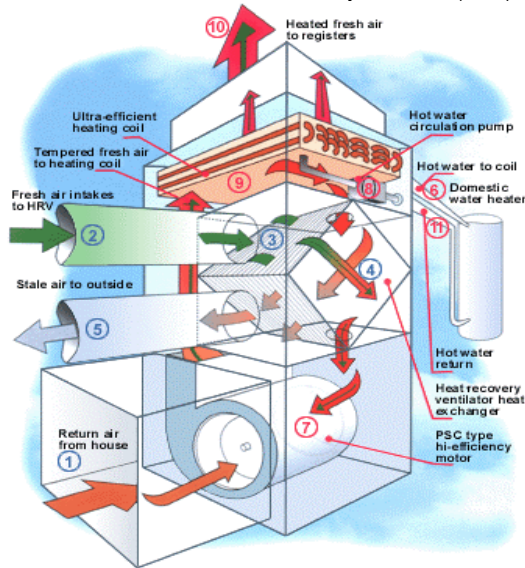
Yet our homes today are built to keep fresh air out. All in the name of energy efficiency.

As a result, you've cut your heating and air conditioning costs. Excellent. But at the same time you have made it more difficult for fresh air to move into your home and for stale air to move out.

The indoor air quality has deteriorated, and that makes the home environment uncomfortable and unhealthy.

The brilliant Lifebreath Clean Air Furnace®, manufactured by Nutech Brands Inc. uses a domestic water heater as its heat source. The efficient system creates a healthier, more comfortable home environment while lowering energy bills. This combination heating system results in higher efficiency ratings than are possible with conventional furnaces i.e. - lower fuel costs for you.

It offers a solution to protect the occupants from the pollutants in your eco-home while reducing heating and air conditioning costs and has a built-in Heat Recovery Ventilator (HRV) that replaces stale air with fresh.



The Lifebreath Furnace brings outdoor air through the built-in HRV, ensuring fresh, healthy heating of your home - all for the cost of a high efficiency furnace. Although your eco-home will not always require heating, the ventilation component of the HRV works year-round to provide a constant stream of fresh air to every room of your house.

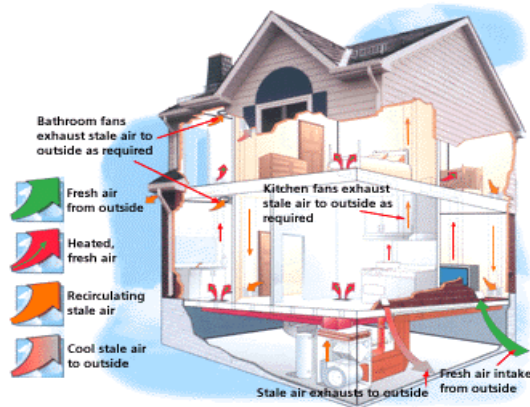
Lifebreath operates safely and quietly. Instead of the periodic bursts of hot air distributed by conventional furnaces, a steady stream of warm air is released throughout the house - reducing drafts, and creating a more even temperature distribution. The atmosphere in your EcoHouse will be noticeably improved.

This heating system provides constant ventilation and a steady stream of warm air for the healthiest, most comfortable home environment possible. This occurs with a system efficiency of up to 90%.

The Clean Air Furnace allows for the addition of a plenum-mounted air conditioner. As long as the furnace is controlled by a thermostat with a fan auto/on switch, users can select heating or cooling with ventilation to meet your climate control needs in every season.

#### LEGEND:

1. Warm, stale air from the home is returned to the Lifebreath Clean Air Furnace.
2. Outdoor air travels through the fresh air intake and is brought into the integral HRV
3. The fresh and stale air pass through opposite sides of the HRV's aluminium heat exchange core.
4. Heat from the stale air is transferred to the fresh air.
5. Stale air is exhausted outside.
6. Hot water is sent from the water heater to the furnace heating coil.
7. A PSC type high-efficiency fan blows the tempered fresh air from the HRV into the coil.
8. The circulation pump distributes hot water through the coil.
9. The circulating hot water heats the air to the desired temperature.
10. Warm, fresh air is distributed to registers throughout the EcoHouse.
11. The hot water travels through the coil and returns to the water heater for domestic use.



The compact Clean Air Furnace uses hot water as its heat source. Water is pumped from your home water heater to the furnace heating coil. A fan with a PSC high-efficiency motor blows the fresh air from the HRV into the heating coil where the circulating water warms the air. Water leaves the heater, travels through the hot water circulation pump, and returns to the water heater. As the water travels through the furnace's heating coil, air is warmed and sent to registers throughout the house.

The HRV removes stale, contaminated air from inside the EcoHouse to the outdoors. At the same time, it draws fresh, oxygen-laden air from outside and distributes it throughout the house. Polluted air is constantly being replaced by an equal quantity of fresh, clean air.

#### FEATURE 5: HOME POWER PLANT

According to some theories, there is an "endless" source of energy emanating from magnets. The magnets used in our designs are able to maintain their magnetic qualities for over twelve hundred years - a long time when gauged by human life expectancy, but is not forever.

The Lutec 1000 is the first free energy machine to be developed to commercial stage anywhere in the world. It will produce up to 1000 watts of DC electricity 24h a day, every day, which will be stored in a battery bank and then inverted to AC power and connected directly into the home or business.

The Lutec 1000 draws the power it requires to run itself from the same battery bank. The average house in Cairns, Queensland, uses only fourteen of the twenty four kilowatt hours able to be stored in twenty four hours by this method.

This way of producing electricity is non polluting. It will assist to bring down green house gases and therefore help cure our sick and dying planet. There are strong community health benefits. It will help slow the rate of use of non renewable resources, like oil. It will help reduce airborne emissions of gases and elements that ruin our forests and lakes. No buying petrol or diesel to run generators. No nuclear meltdowns or disposal problems with radioactive by-products, no high sulphur and nitrous content, foul smelling, coal burning.

Buyers can structure their repayments so that the power produced pays for their purchase. Convenience plus, no more black outs, brown outs, interruptions because of line maintenance, lightning strike, heavy rain, strong wind, fire, cyclone, flood, poor maintenance at power stations.

Add to all that better computer security, personal security, more heating, more disposable income, more cooling, more appliances purchased because it costs nothing to run them.

There are many, many more excellent reasons why everyone should have one of these.

[Find EcoHouse-Plans \(Find ecological home plans at EcoHouse-Plans.com\)](http://EcoHouse-Plans.com)



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